

FIG. 1

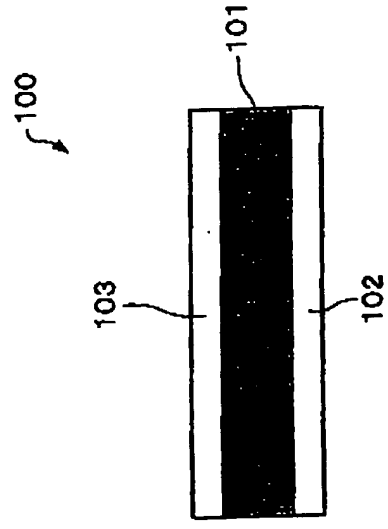


FIG. 2

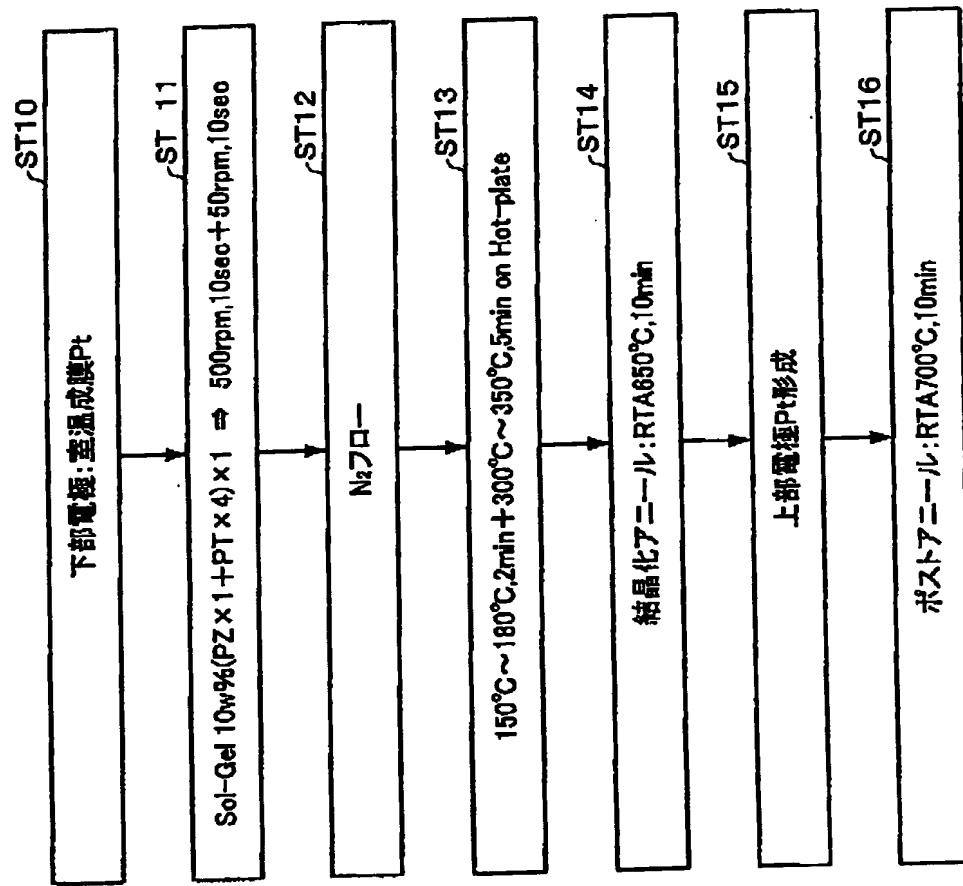


FIG. 3

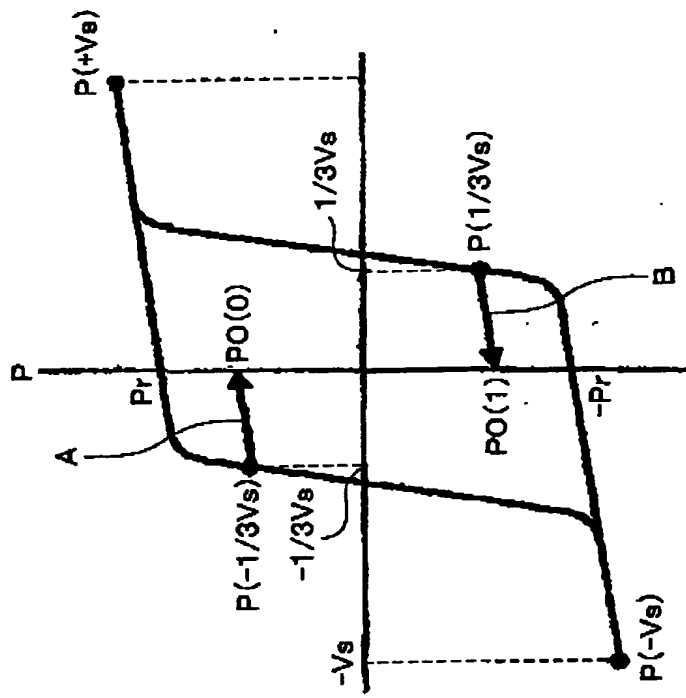


FIG. 4A

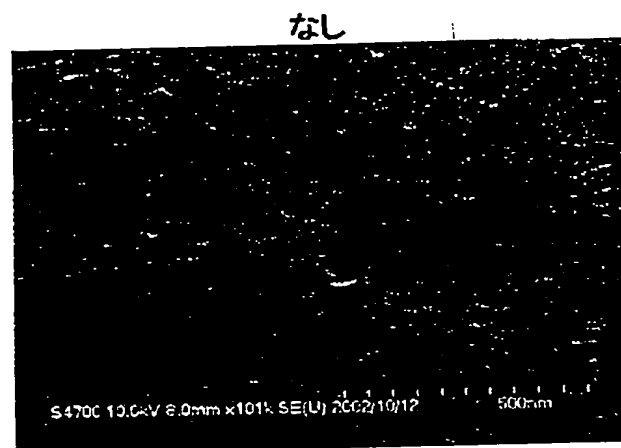


FIG. 4B

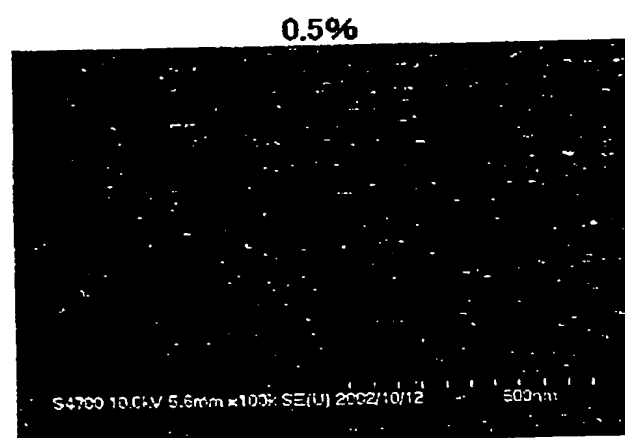


FIG. 4C

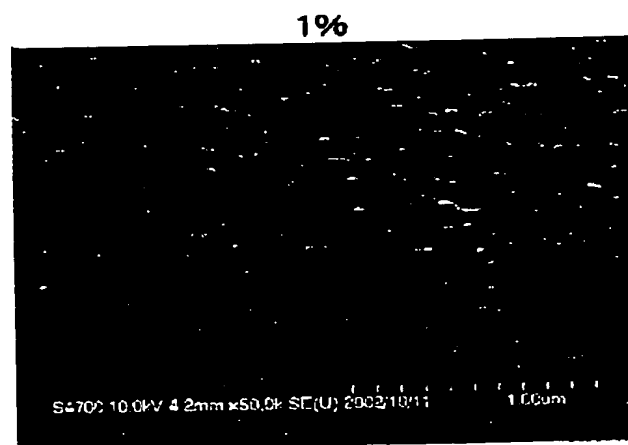


FIG. 5A

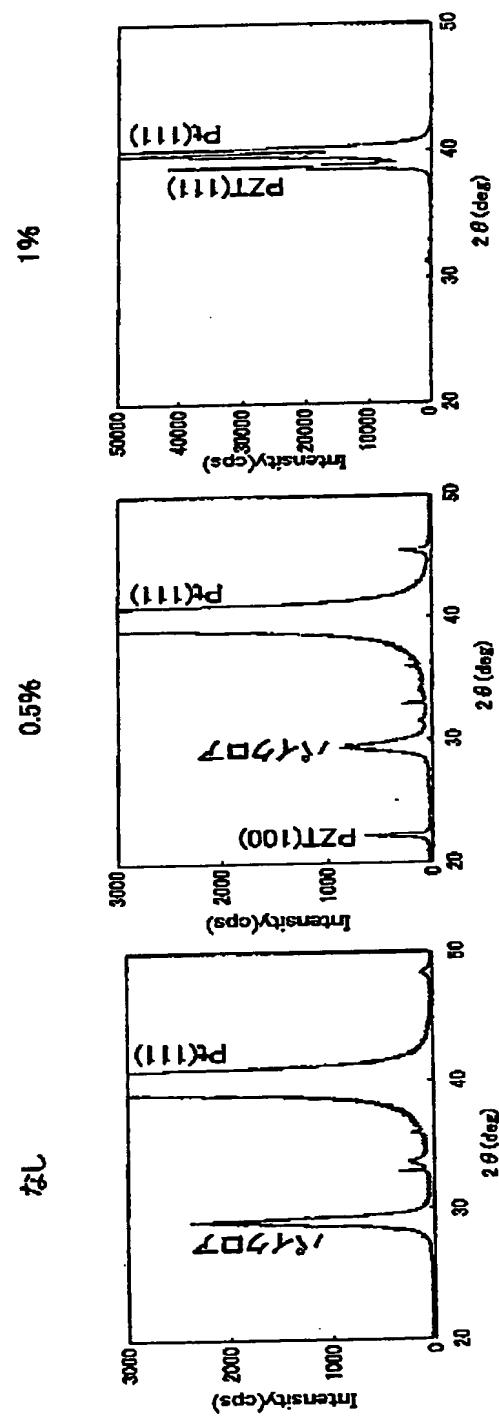


FIG. 5B

FIG. 5C

FIG. 6A

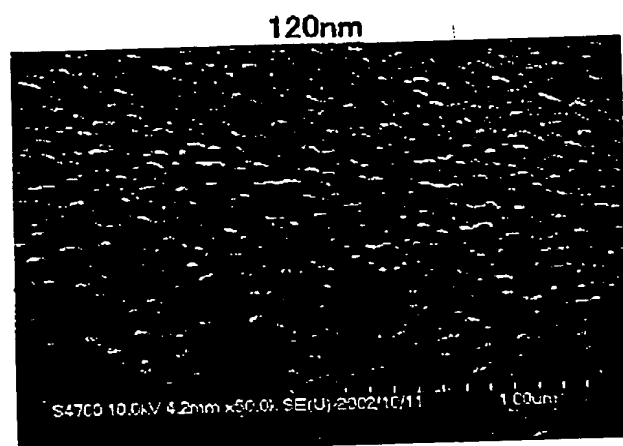


FIG. 6B

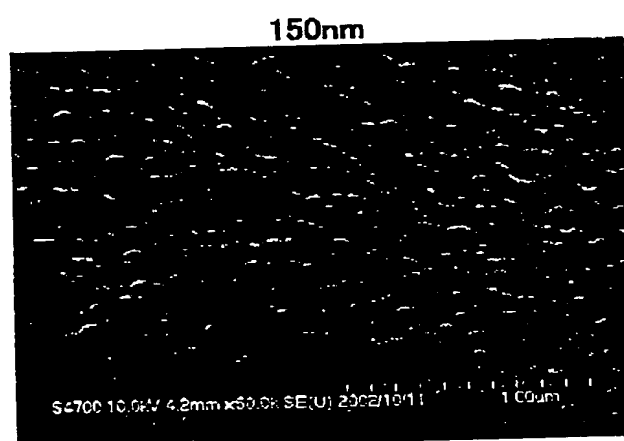


FIG. 6C

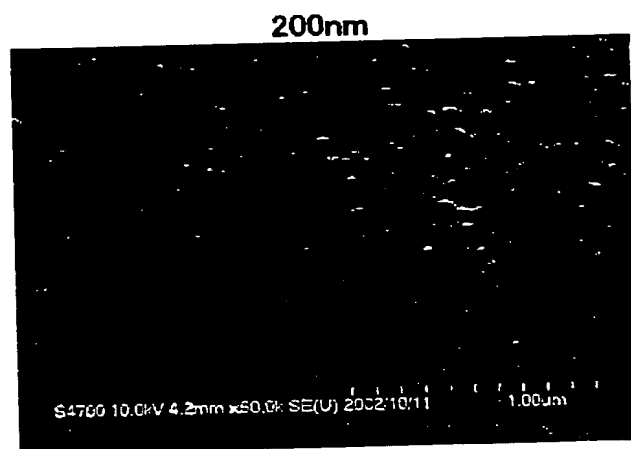


FIG. 7A

120nm

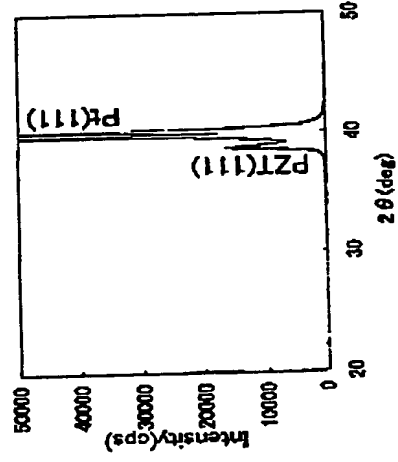


FIG. 7B

150nm

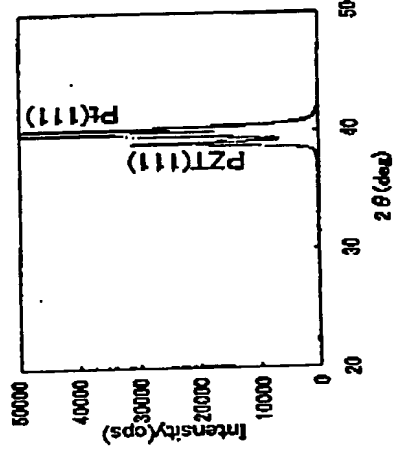


FIG. 7C

200nm

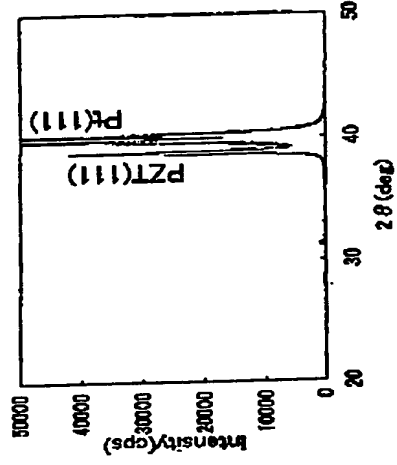


FIG. 8A

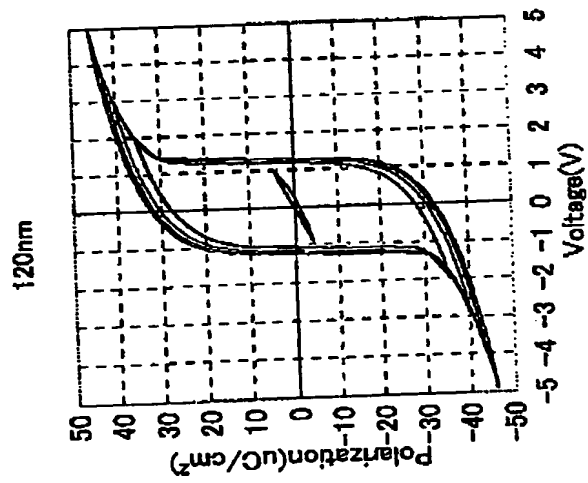


FIG. 8B

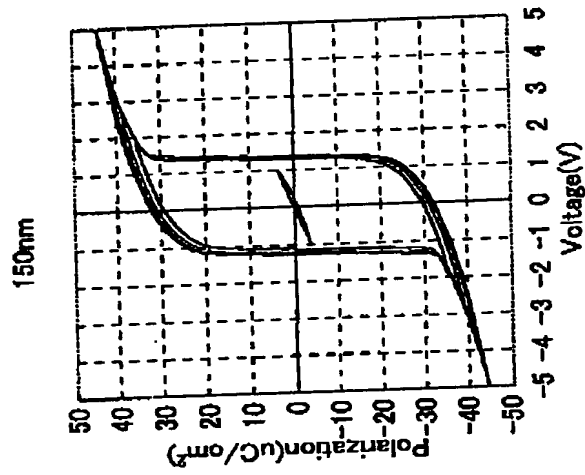


FIG. 8C

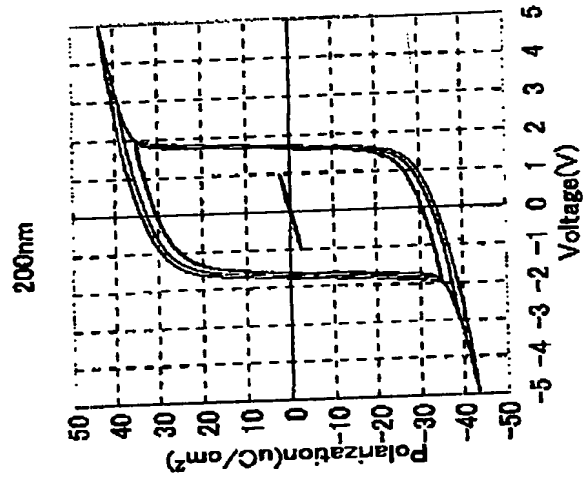


FIG. 9A

120nm

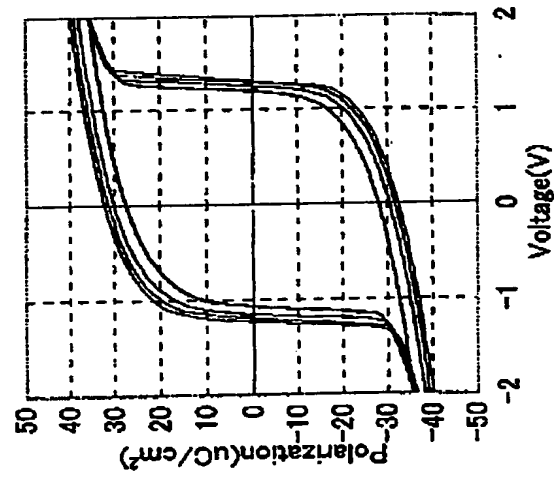


FIG. 9B

150nm

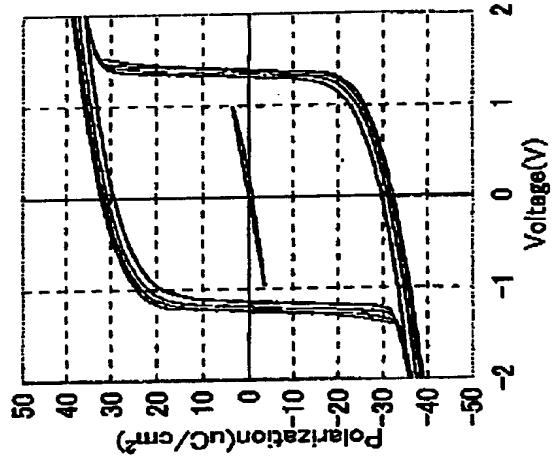


FIG. 9C

200nm

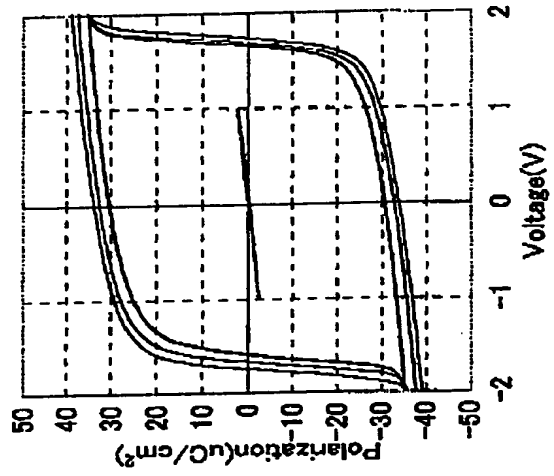


FIG. 10A

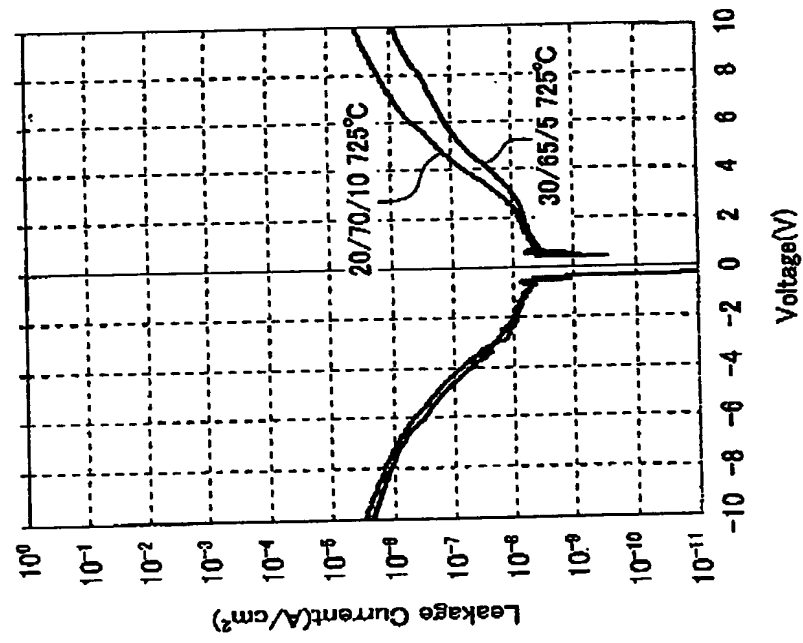


FIG. 10B

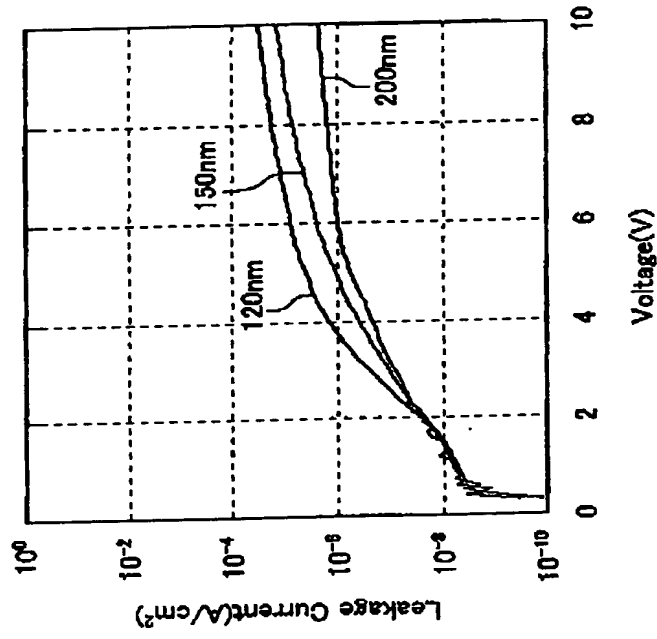


FIG. 11A

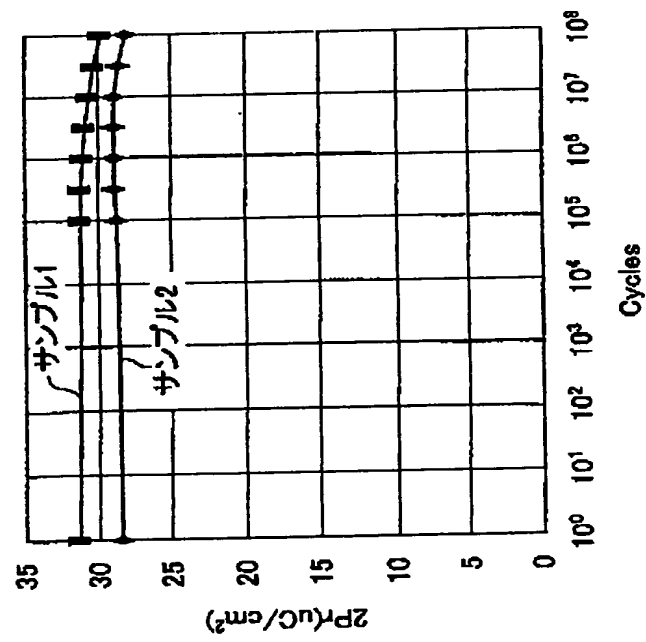


FIG. 11B

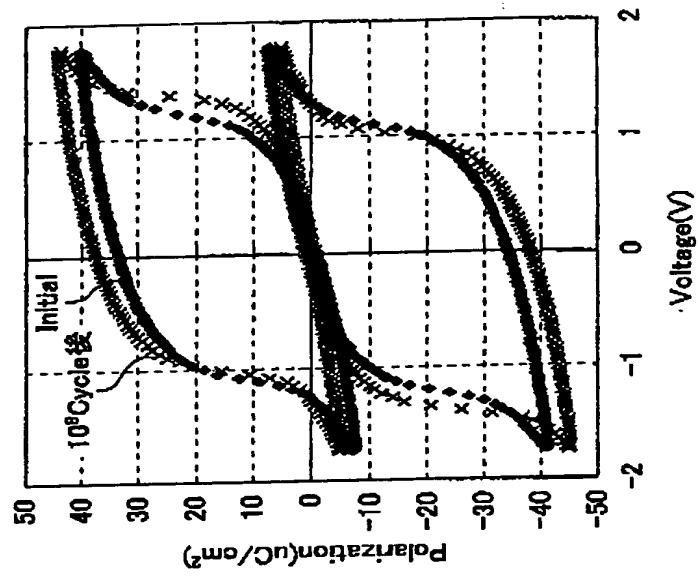


FIG. 12

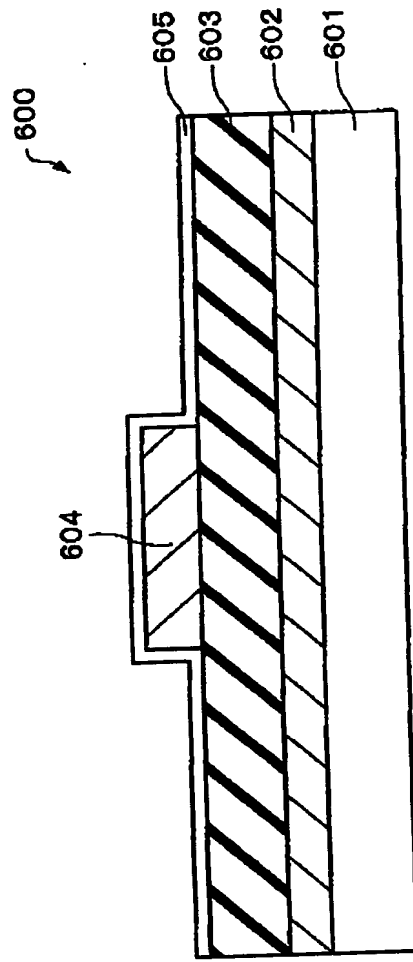


FIG. 13

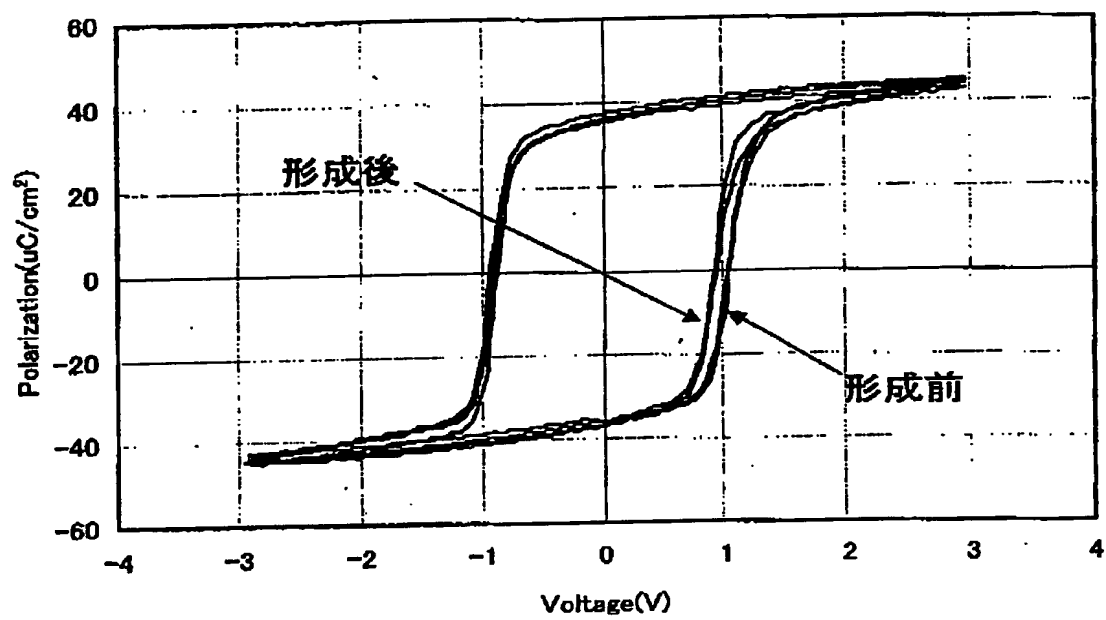


FIG. 14

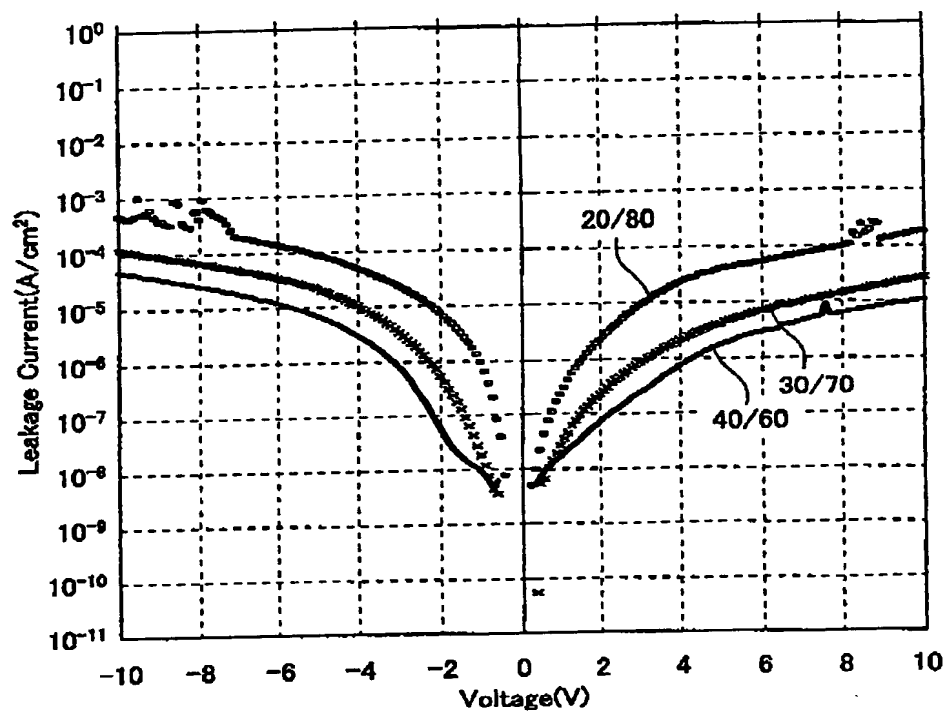


FIG. 15

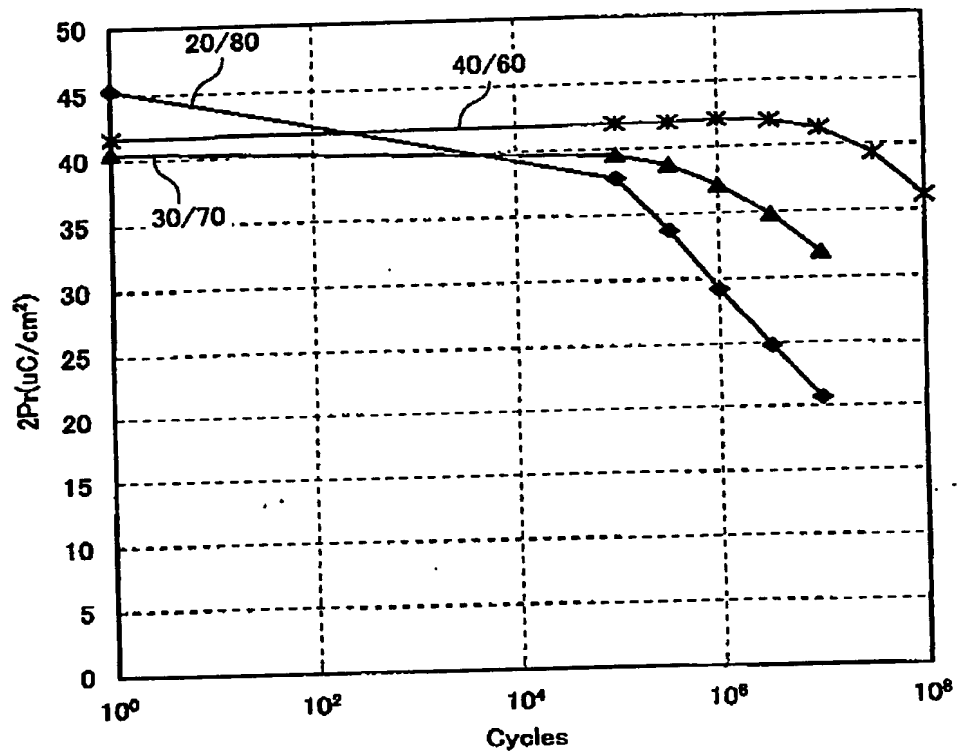


FIG. 16

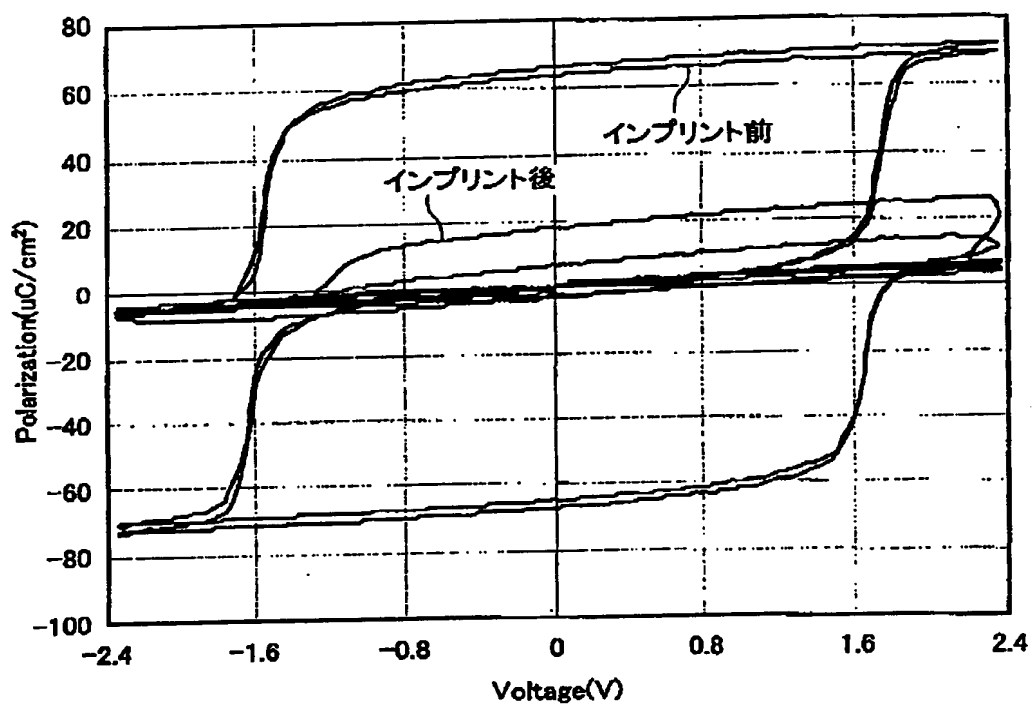


FIG. 17A

Nb=0 [mol%]

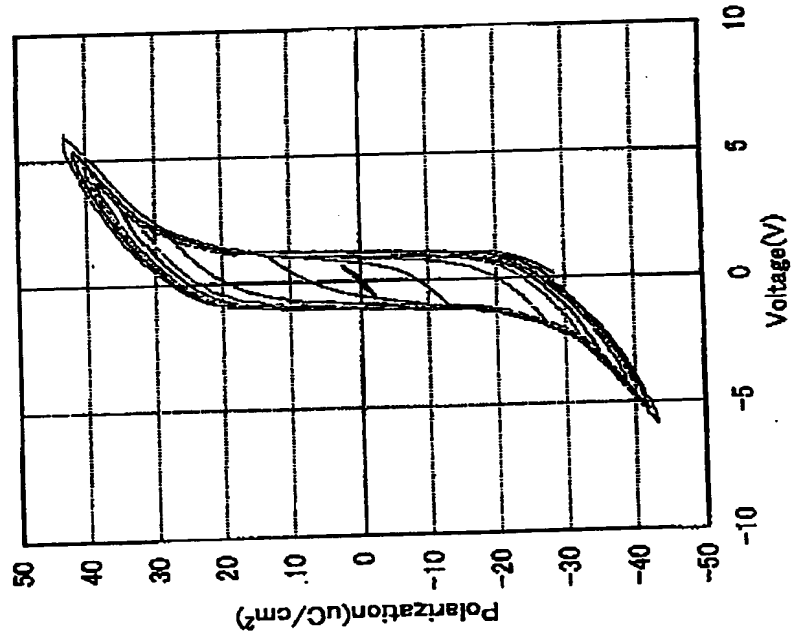


FIG. 17B

Nb=5 [mol%]

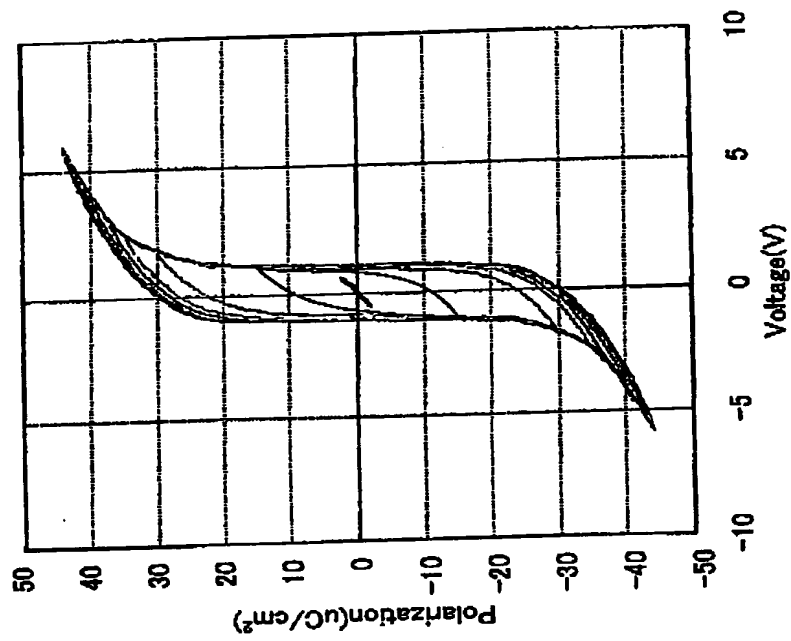


FIG. 18A

Nb=10 [mol%]

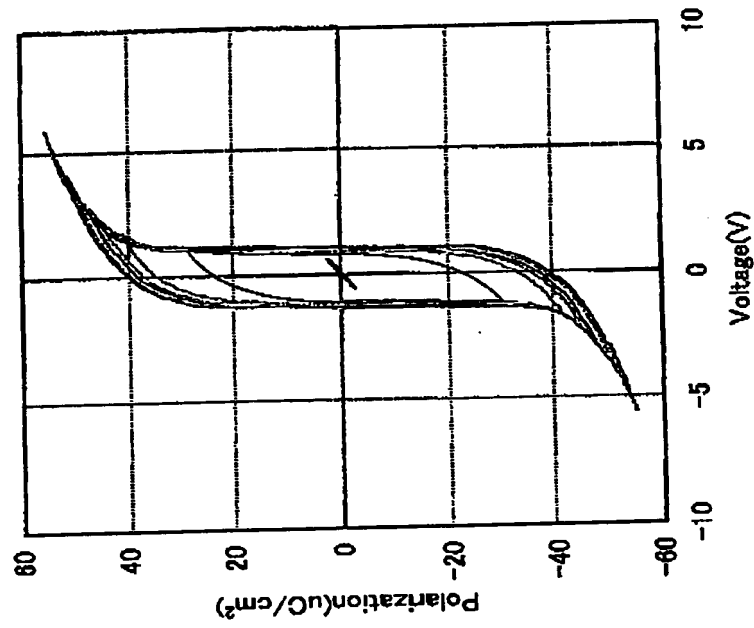


FIG. 18B

Nb=20 [mol%]

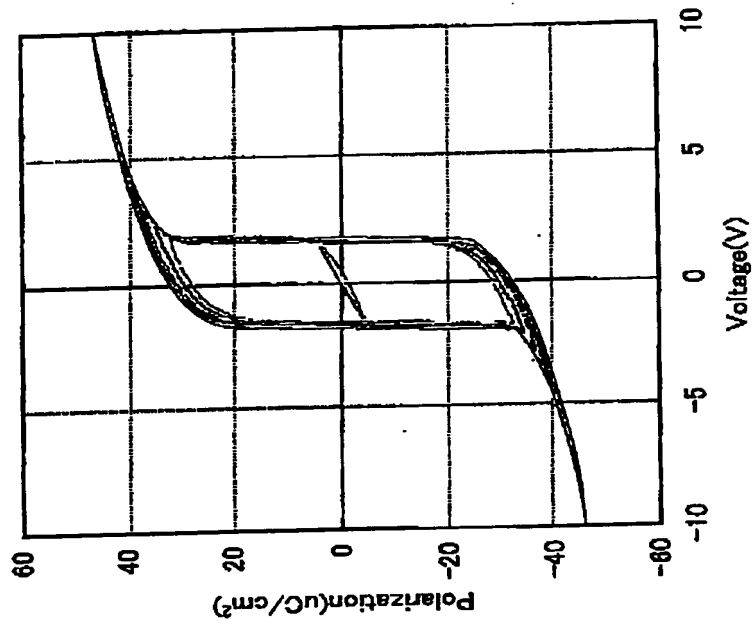


FIG. 19A

Nb=30 [mol%]

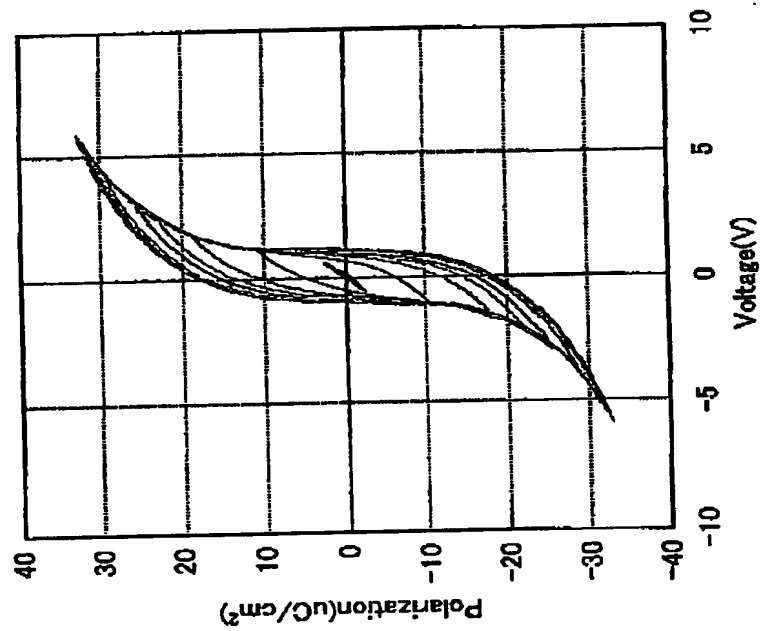


FIG. 19B

Nb=40 [mol%]

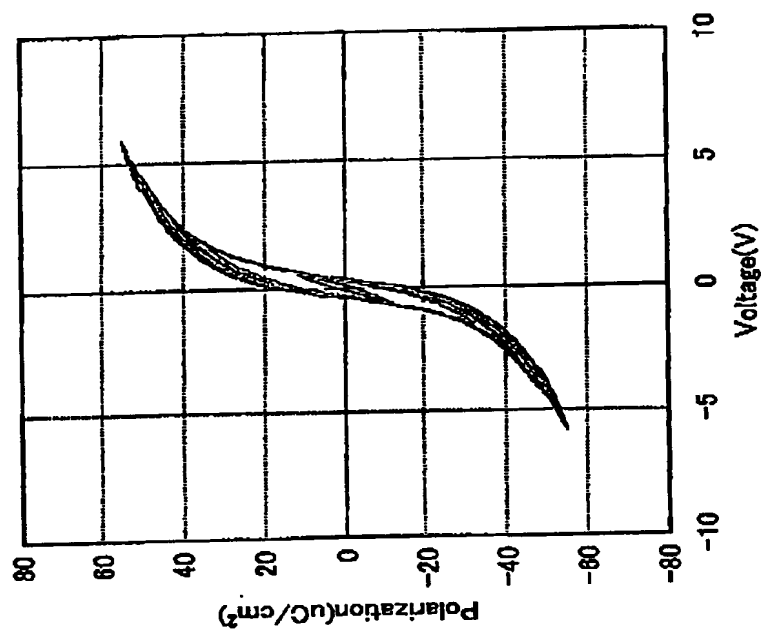


FIG. 20

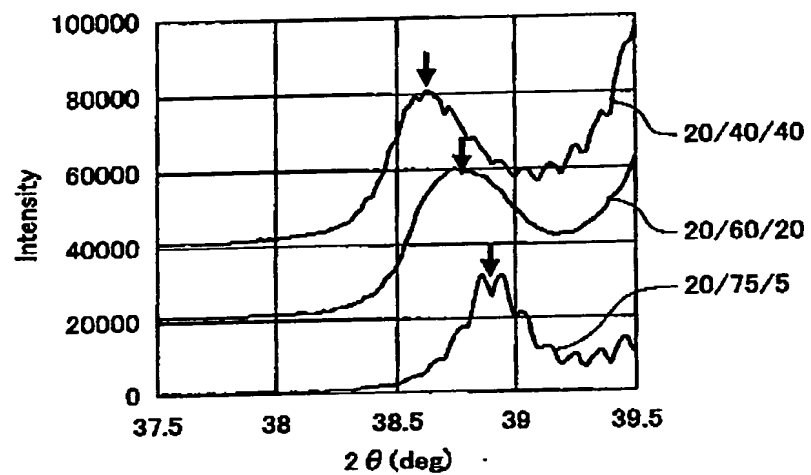


FIG. 21

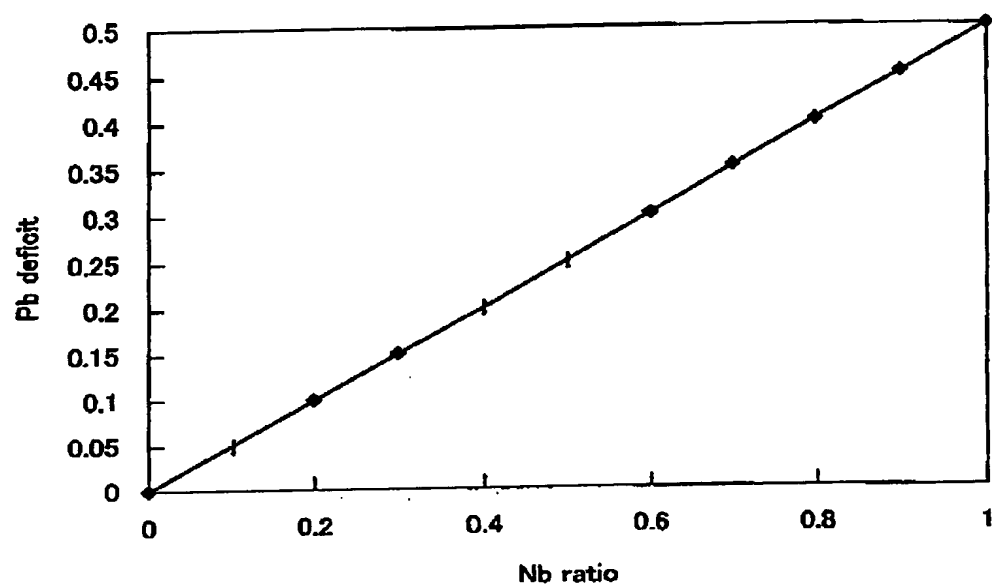


FIG. 22

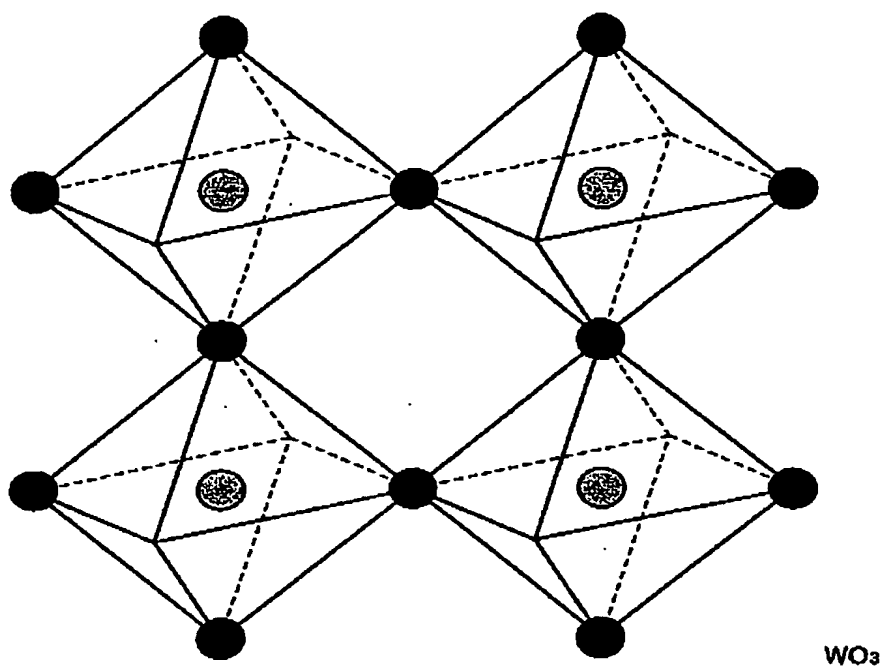


FIG. 23A

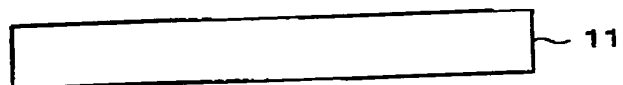


FIG. 23B

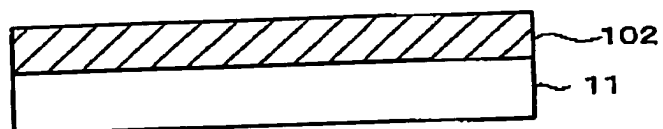


FIG. 23C

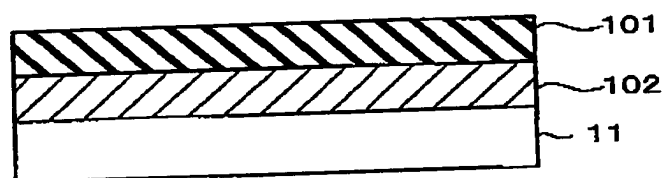


FIG. 24A

| | Nb添加量(mol%) | | | | |
|------------------|-------------|---------|---------|---------|---------|
| | 0 | 5 | 10 | 20 | 30 |
| a | 4.04 | 4.04 | 4.01 | 4.00 | 4.00 |
| c | 4.11 | 4.11 | 4.10 | 4.05 | 4.03 |
| V(abc) | 67.0818 | 67.0818 | 65.9284 | 64.8000 | 64.4800 |
| V/V ₀ | 100.0 | 100.0 | 98.3 | 96.6 | 96.1 |

FIG. 24B

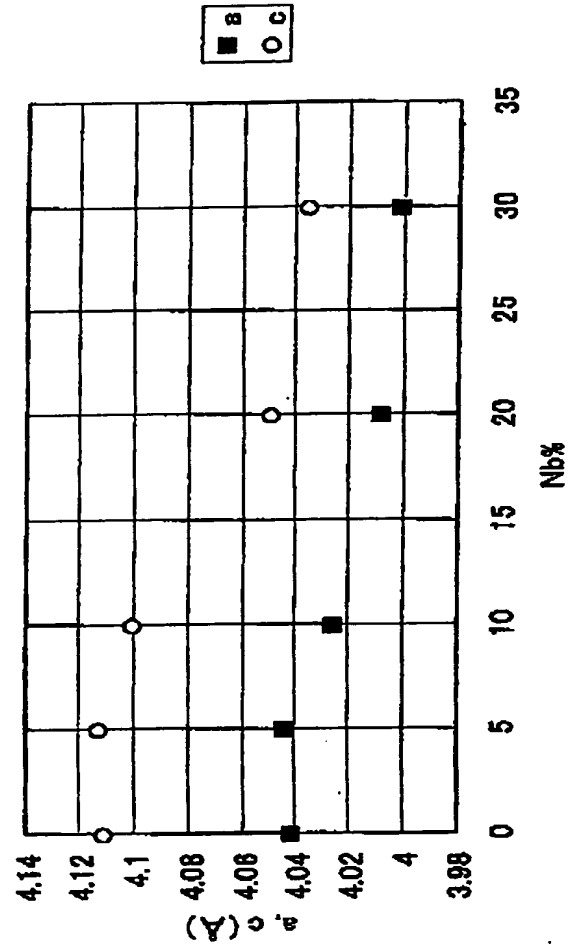


FIG. 25

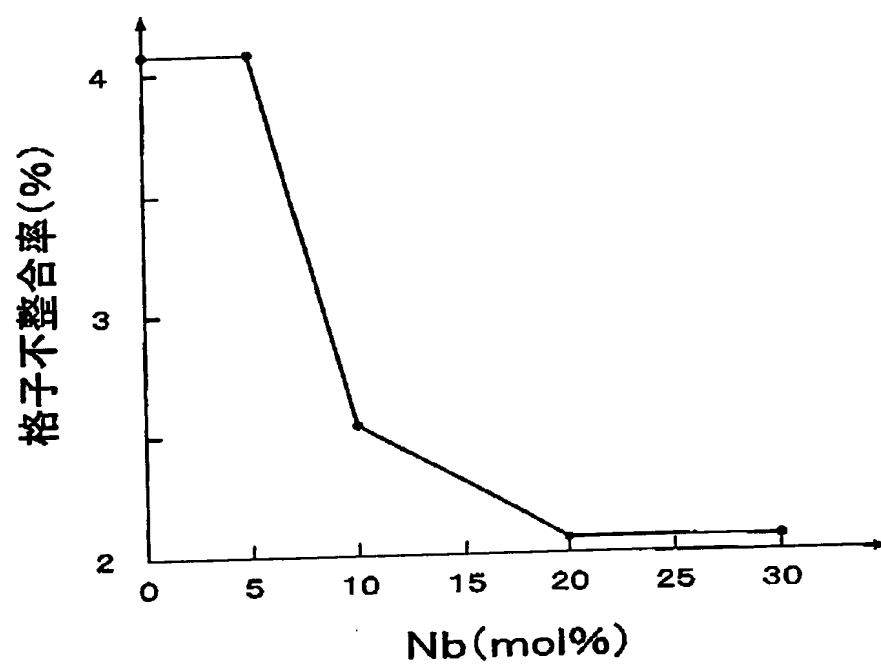
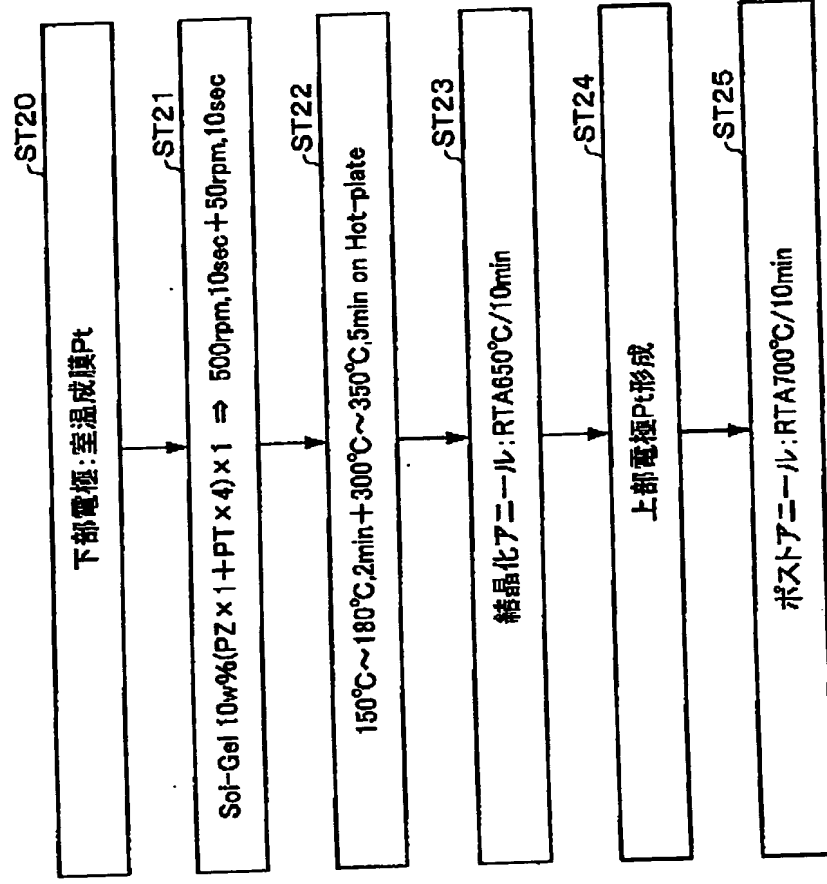
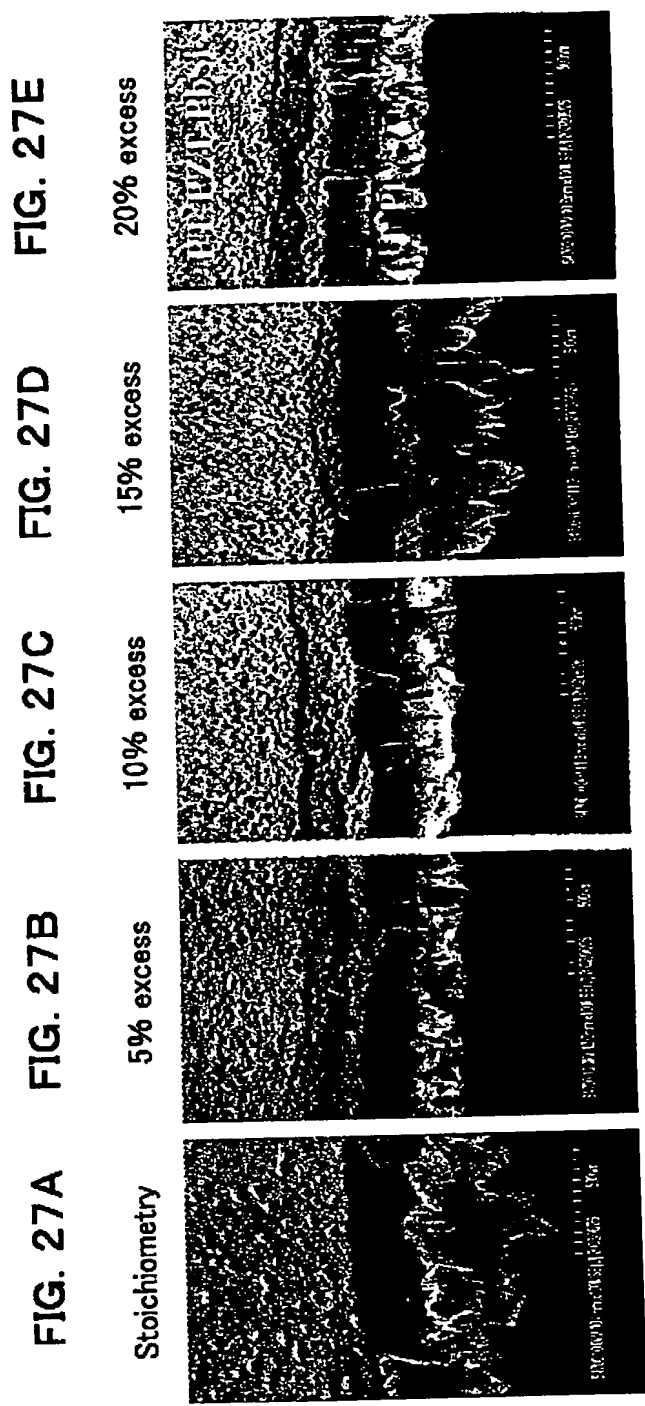


FIG. 26





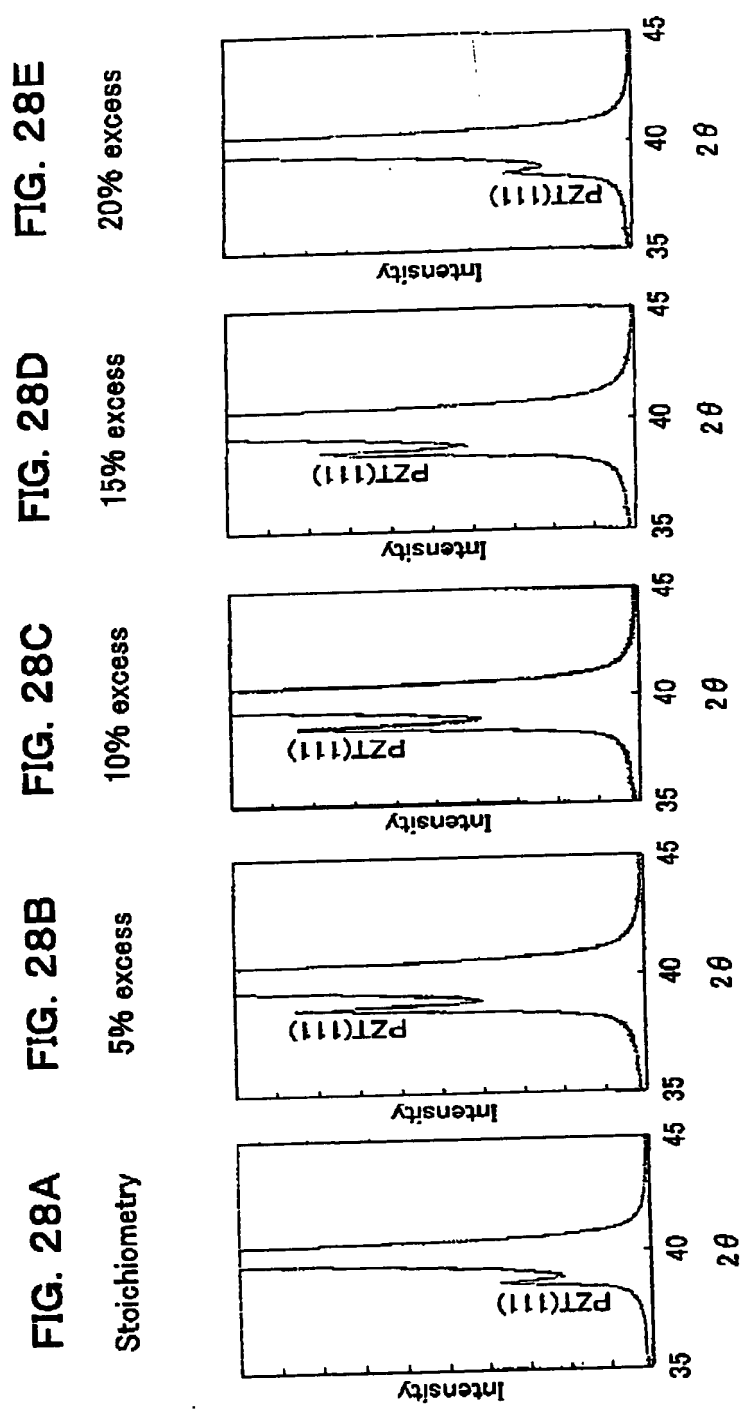


FIG. 29A

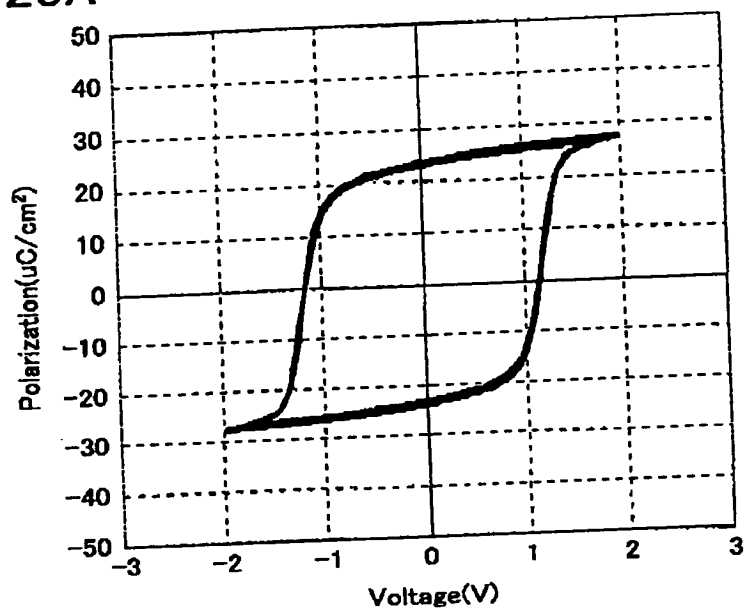


FIG. 29B

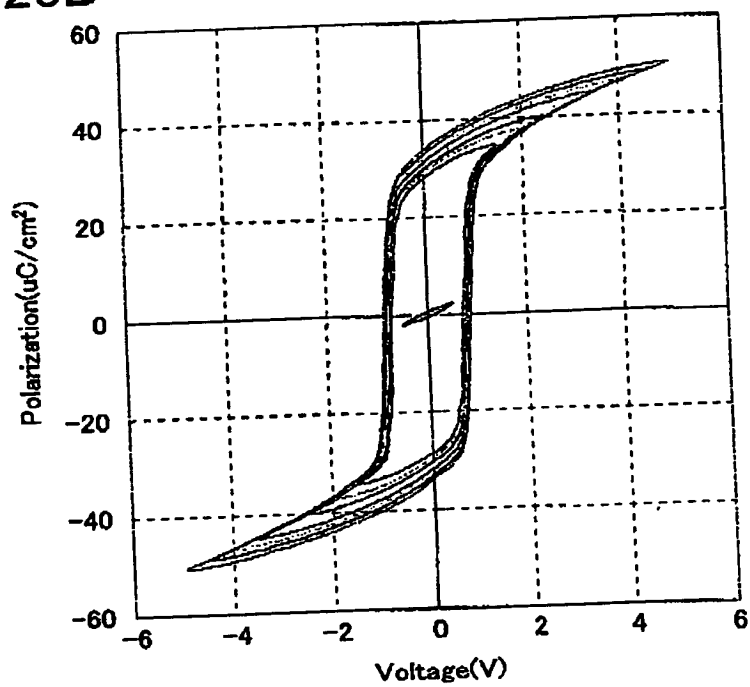


FIG. 30

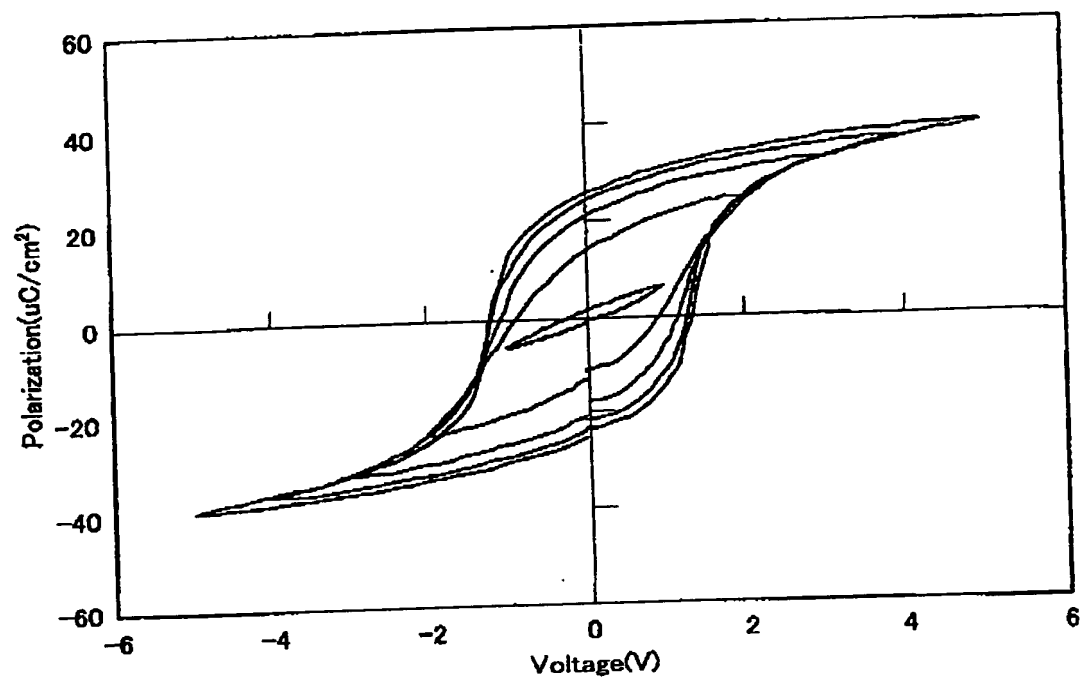


FIG. 31A

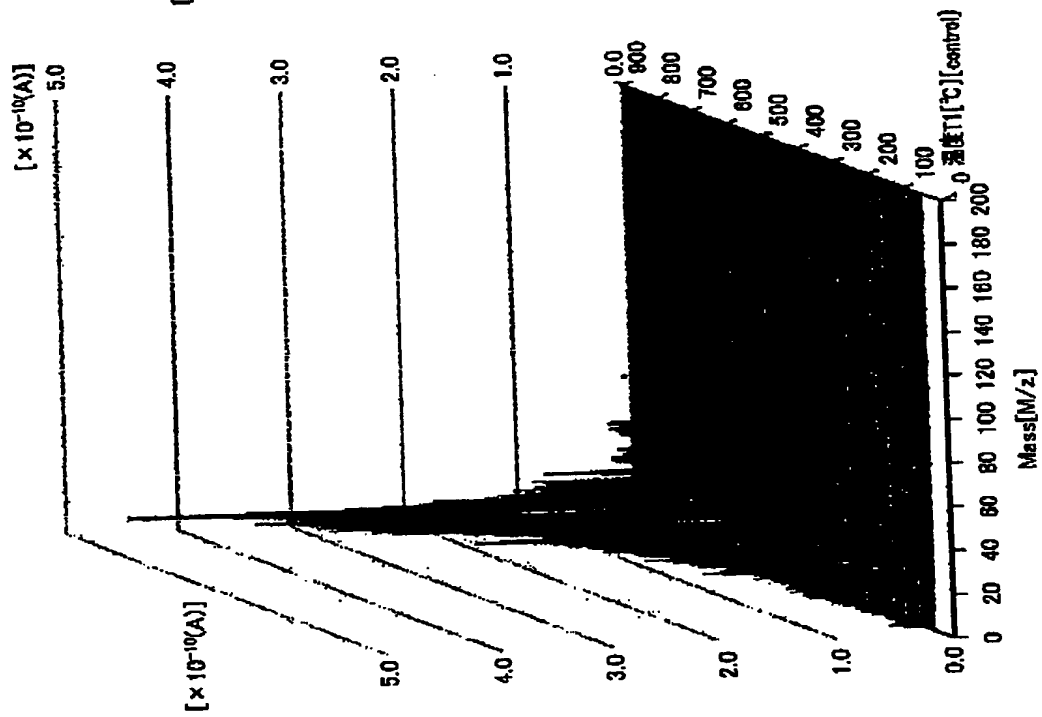


FIG. 31B

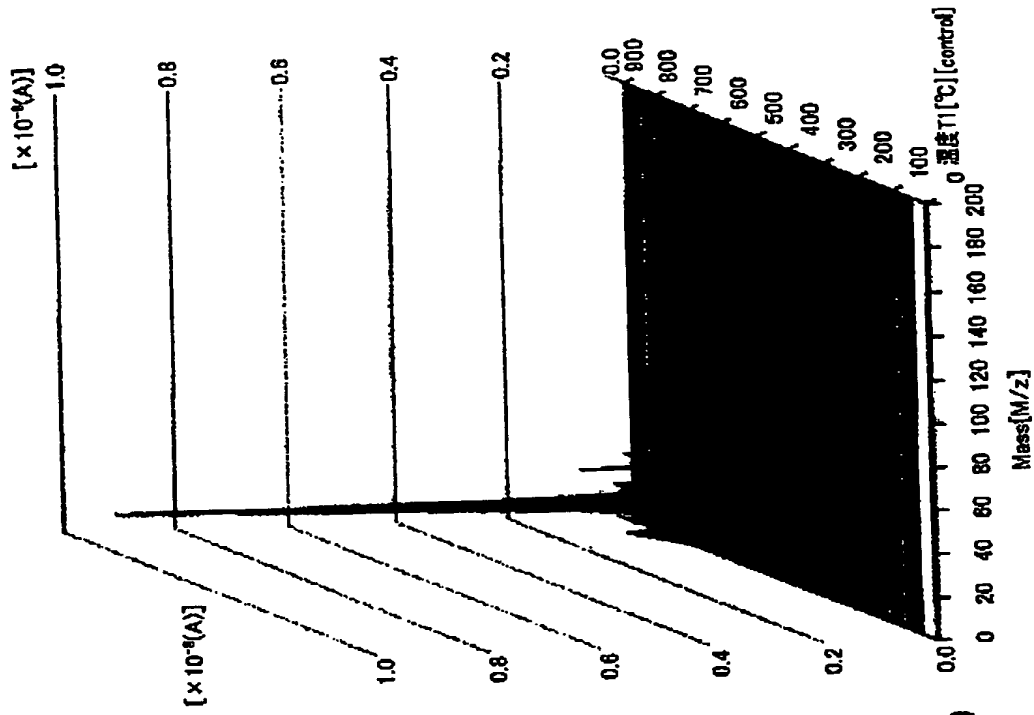


FIG. 32A

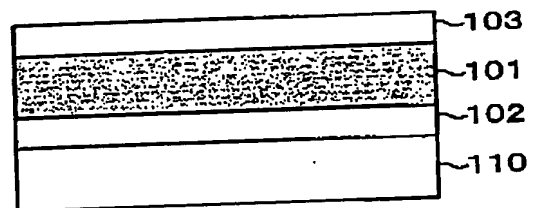


FIG. 32B

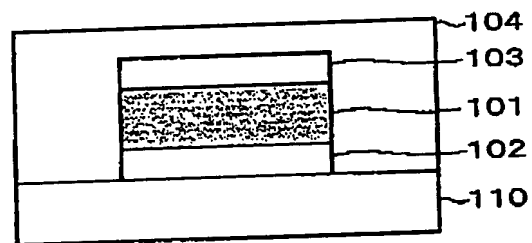


FIG. 32C

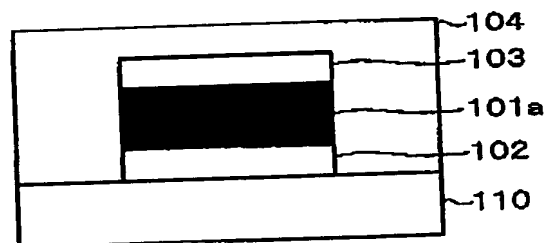


FIG. 33A

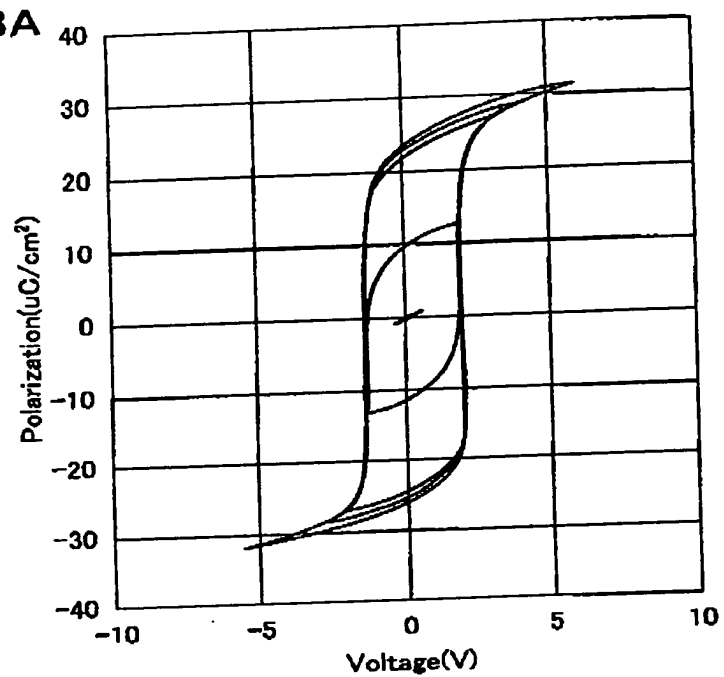


FIG. 33B

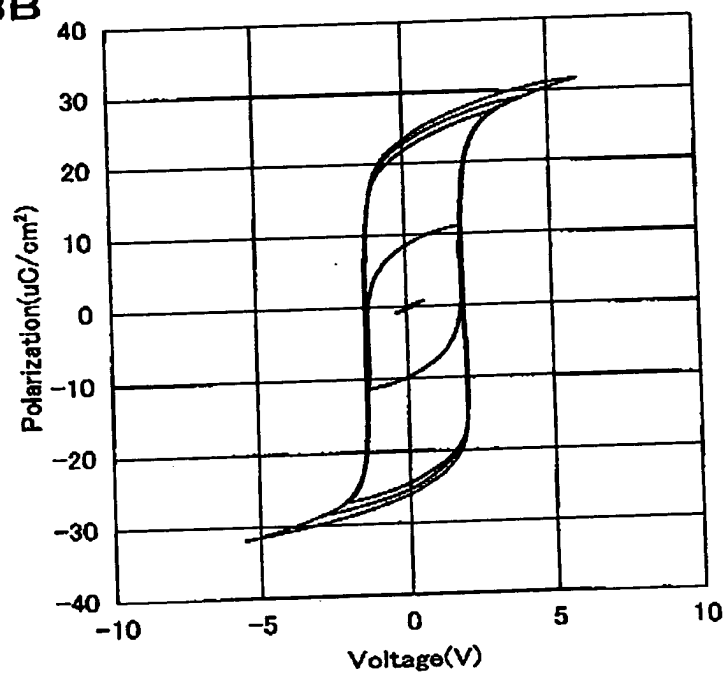


FIG. 34

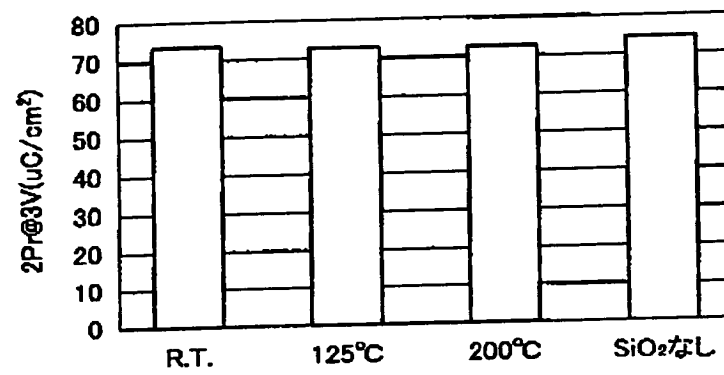


FIG. 35A

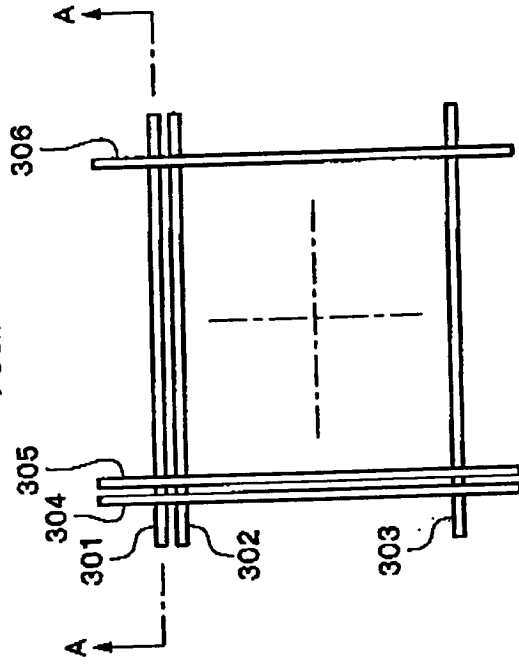


FIG. 35B

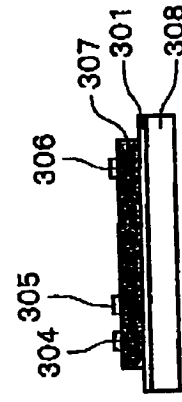


FIG. 36

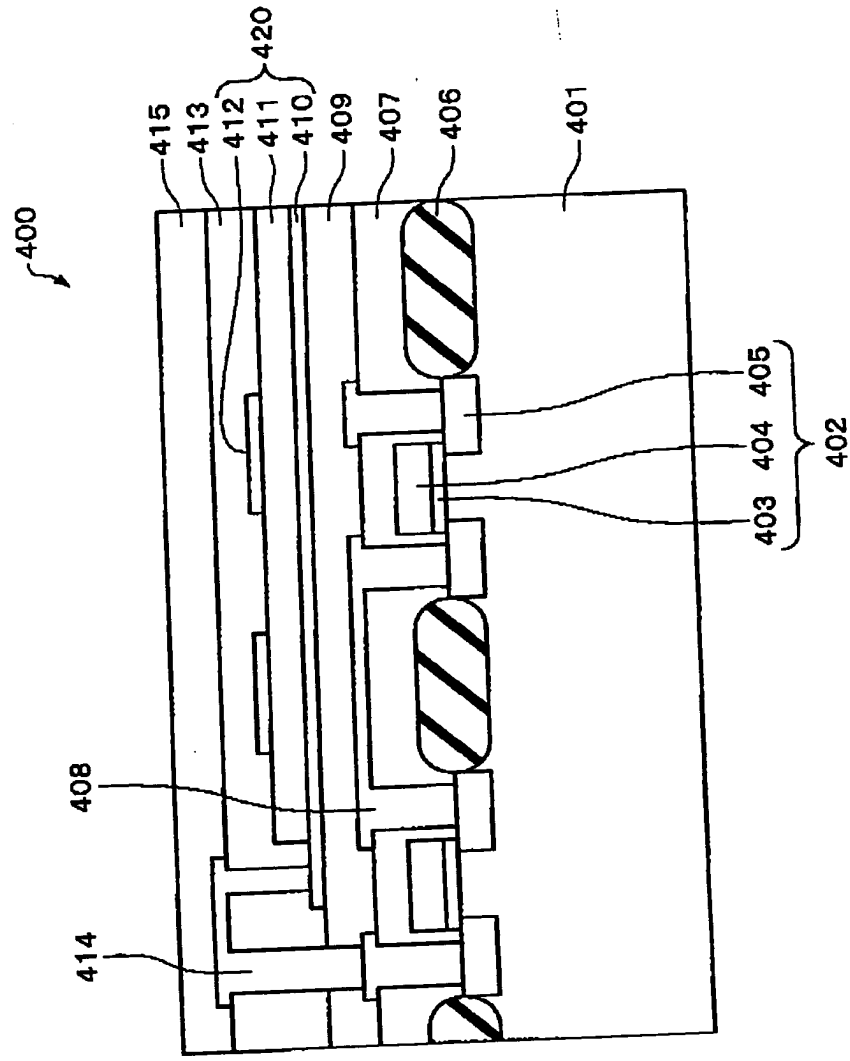


FIG. 37A

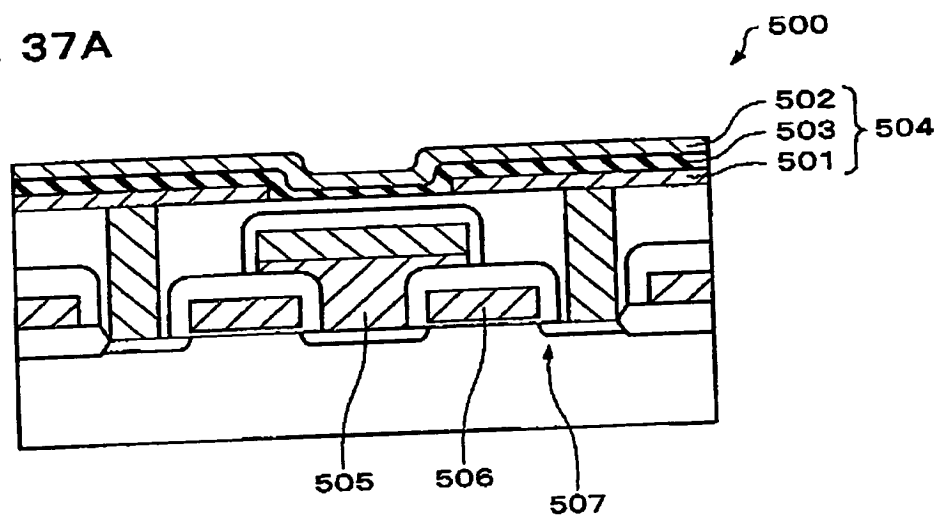


FIG. 37B

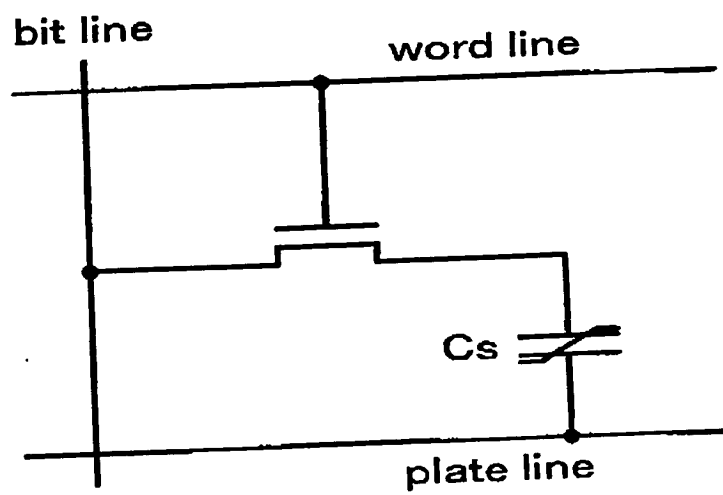


FIG. 38A

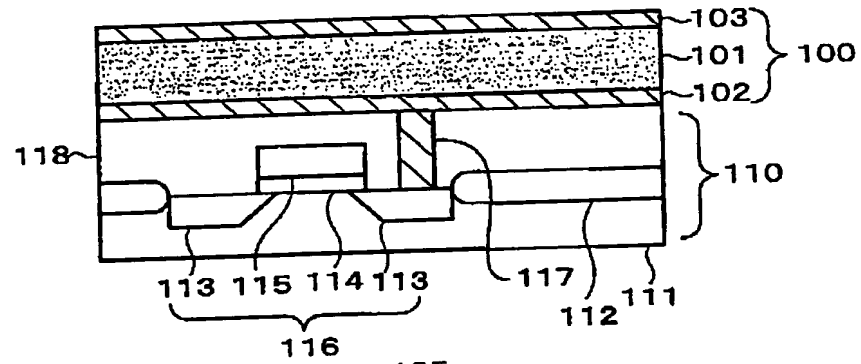


FIG. 38B

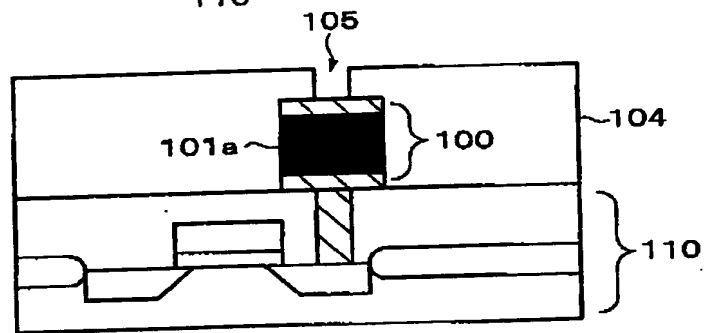


FIG. 38C

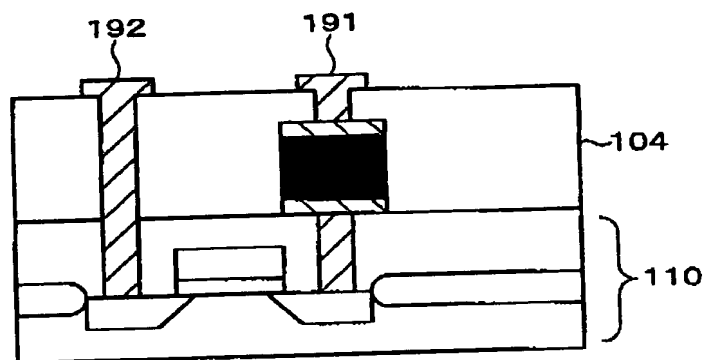


FIG. 39

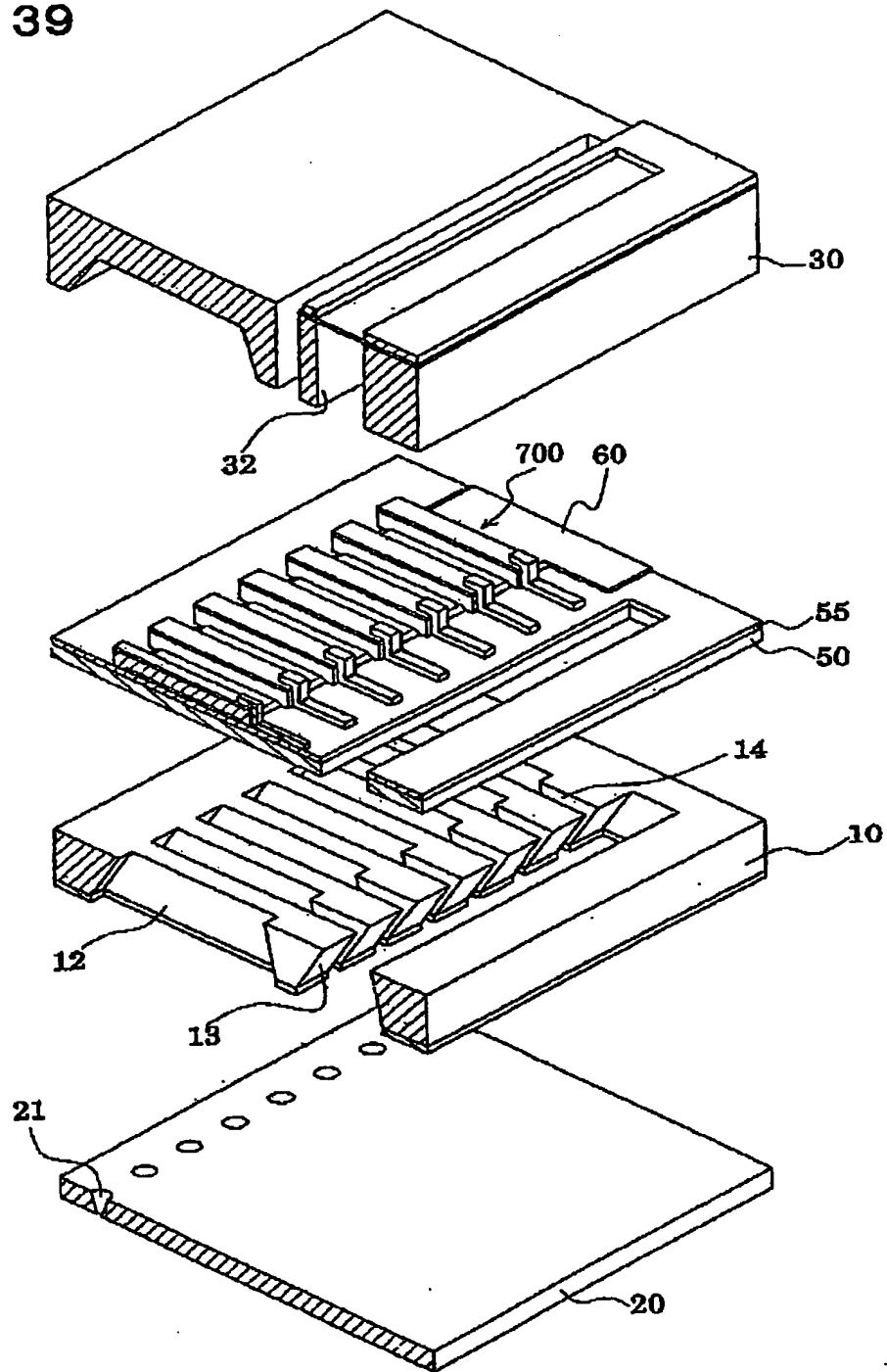


FIG. 40A

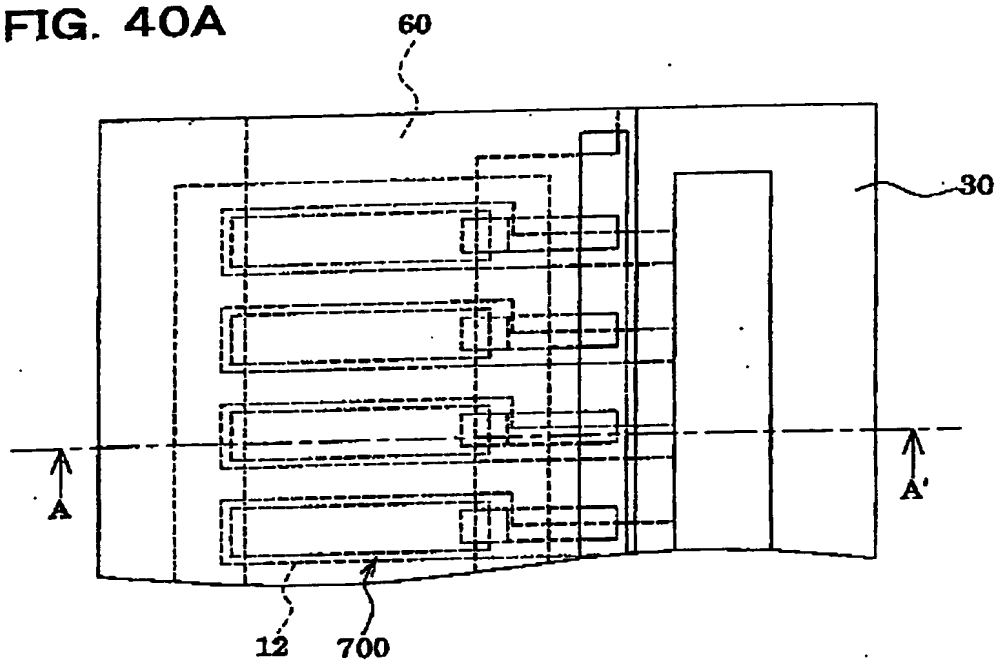


FIG. 40B

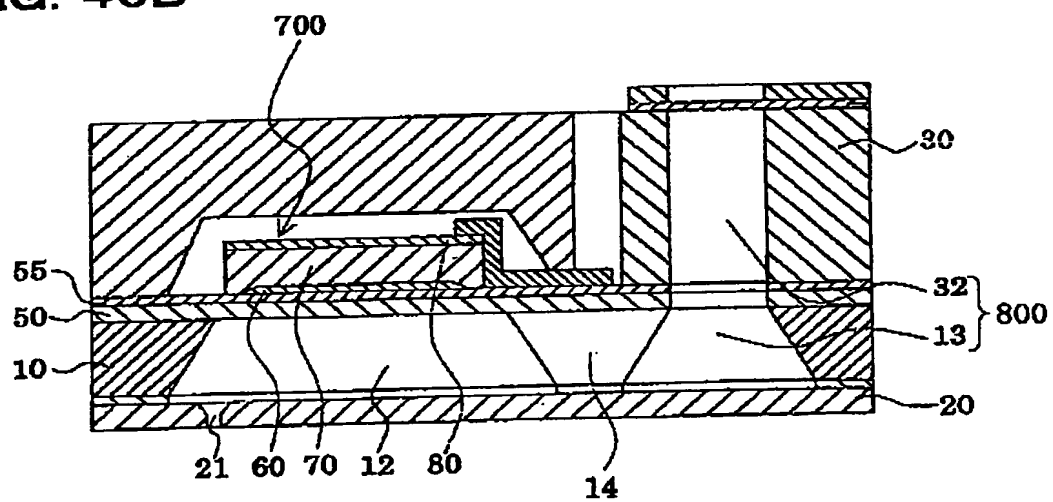


FIG. 41

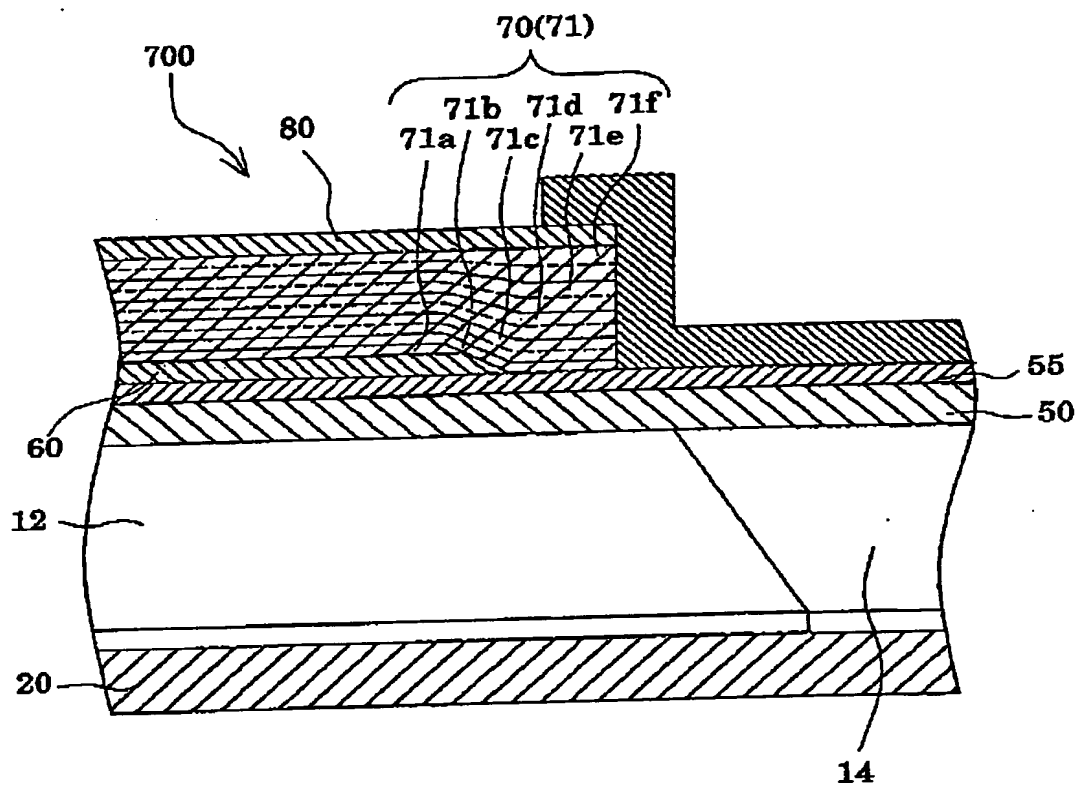


FIG. 43A

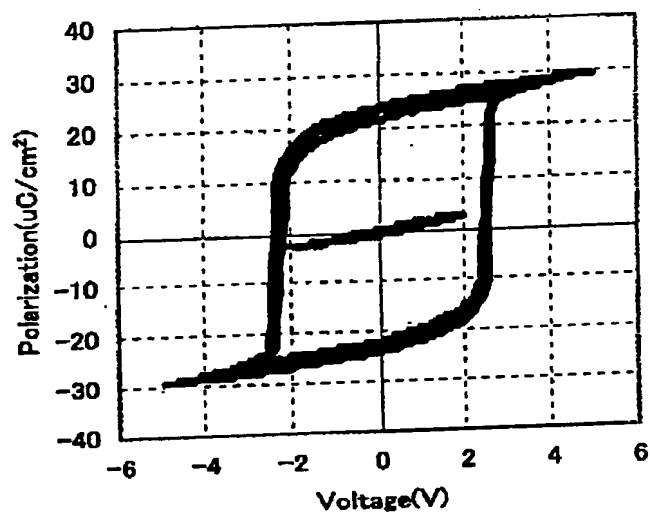


FIG. 43B

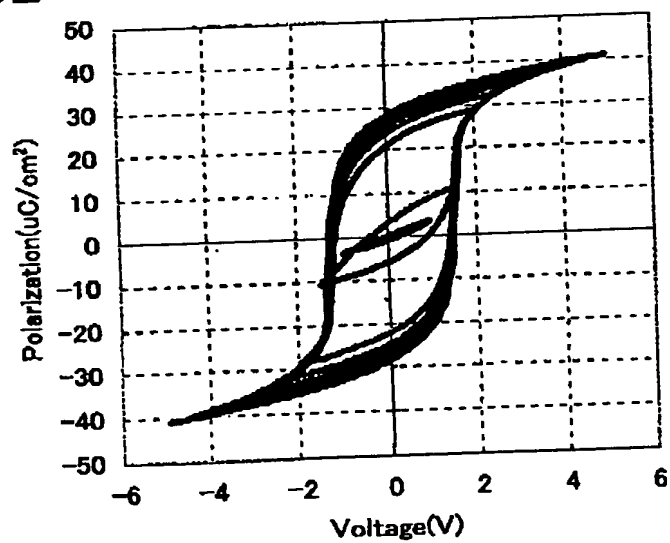


FIG. 44

| 元素 | 原子量 | 価数 (イオン半径(Å)) | 原子半径 (Å) | 結合エネルギー(M-O) (kcal/mol) | イオン化エネルギー (eV) |
|----|--------|------------------------|-------------|----------------------------|-------------------|
| | | | | | |
| Pb | 207.2 | +2(1.08), +4(0.78) | 1.33 | 38.8 | 7.416 |
| Zr | 91.224 | +4(0.72) | 1.6 | | 6.84 |
| Ti | 47.88 | +2(0.86), +3, +4(0.61) | 1.47 | 73 | 6.82 |
| Nb | 92.906 | +3, +4, +5(0.64) | 1.47 | | 6.88 |
| O | 54.36 | -1, -2(1.4) | | | 13.618 |

FIG. 45A

ブラウンミラライト構造 (ABO_{2.5})

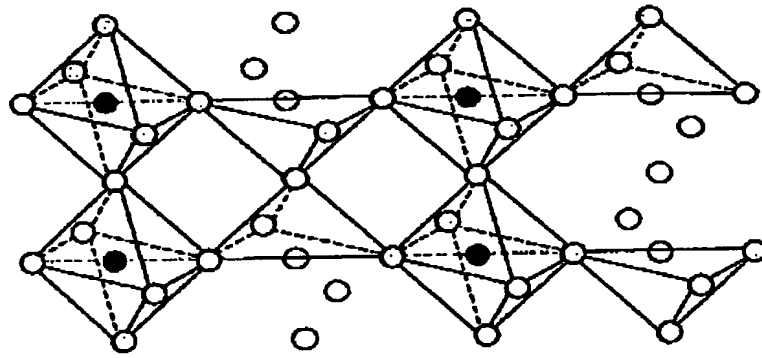


FIG. 45B

陽イオン欠陥

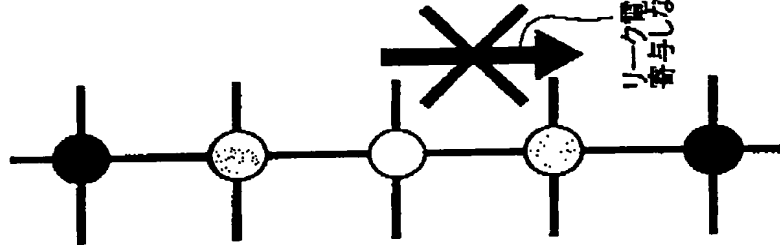


FIG. 45C

陰イオン欠陥

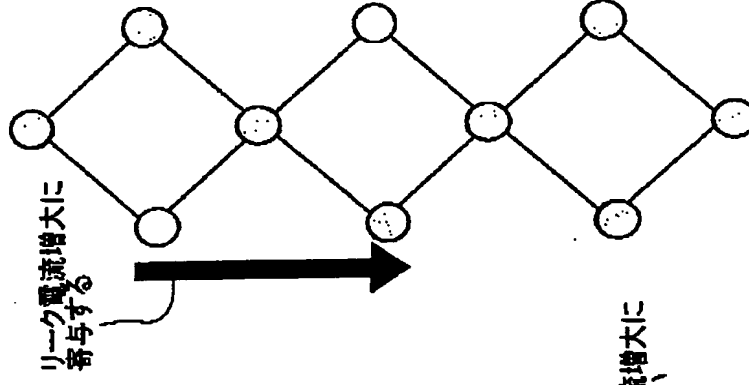
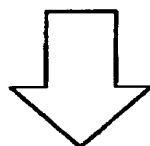
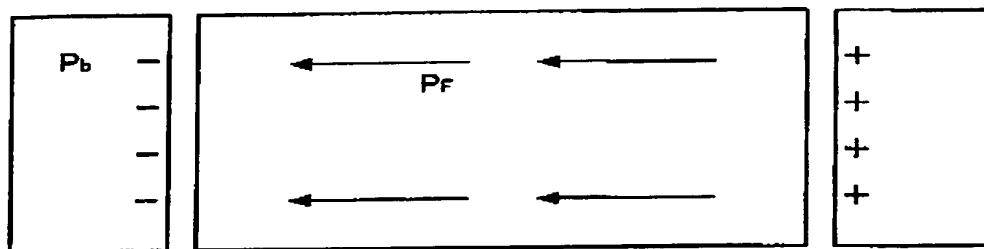
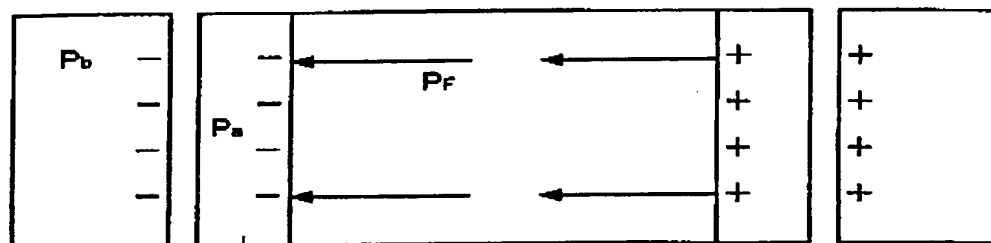


FIG. 46

分極



T_c以下で放置



P_Fを打ち消す方向にP_aが働く